

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
18 April 2002 (18.04.2002)

PCT

(10) International Publication Number  
WO 02/031613 A3

(51) International Patent Classification<sup>7</sup>: G06F 7/60, 17/10, 17/50, G06G 7/48

(21) International Application Number: PCT/IL01/00937

(22) International Filing Date: 10 October 2001 (10.10.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data: 09/689,884 13 October 2000 (13.10.2000) US

(71) Applicant (for all designated States except US): INSYST LTD. [IL/IL]; Har Hotzvim, 7 HaMarpe Street, 91231 Jerusalem (IL).

(72) Inventors; and

(75) Inventors/Applicants (for US only): GOLDMAN, Arnold, J. [IL/IL]; 18 HaPalmach Street, 92542 Jerusalem

(53) (IL). HARTMAN, Jehuda [IL/IL]; 18 HaTzanchanim Street, 76212 Rehovot (IL). FISHER, Joseph [IL/IL]; 3 Mishol HeHadas Street, 97277 Jerusalem (IL). SAREL, Shlomo [IL/IL]; 151 Ma'ale MichMash, 90634 M.P. Yosh (IL).

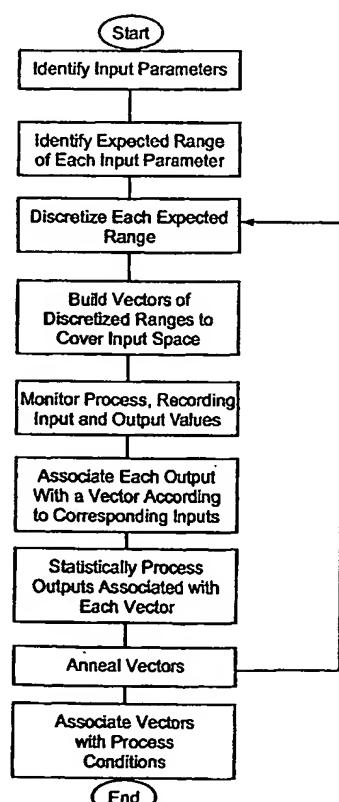
(74) Agent: G. E. EHRLICH (1995) LTD.; 28 Bezalel Street, 52521 Ramat Gan (IL).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian

[Continued on next page]

(54) Title: SYSTEM AND METHOD FOR MONITORING PROCESS QUALITY CONTROL



(57) Abstract: A system and method for monitoring process quality control. A series of input parameters are identified as being significant in effecting the output of a process. Each input parameter has an expected range. Each expected range is discretized into a series of sub-ranges and a vector is built for each possible combination of sub-ranges. The process is then monitored to obtain a statistically significant set of samples, each sample comprising a process output and corresponding inputs (Fig. 2). A knowledge base and model are built (Fig. 5).

WO 02/031613 A3



patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(88) Date of publication of the international search report:  
17 October 2002

**Published:**

— *with international search report*

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/IL01/00937

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) : G06F 7/60, 17/10, 17/50; G06G 7/48  
US CL : 703/2, 6, 13

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 703/2, 6, 13

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
Please See Continuation Sheet

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,866,437 A (CHEN et al.) 02 February 1999 (02.02.1999), Abstract, Figures 2-3, Background of the Invention, Summary of the Invention, col 2, lines 64 et seq.	1-26
X	US 6,125,235 A (PADILLA et al.) 26 September 2000 (26.09.2000), Abstract, Figures 1-6, Background of the Invention, Summary of the Invention, col 5, lines 56 et seq.	1-26
X	US 5,408,405 A (MOZUMDER et al.) 18 April, 1995 (18.04.1995), Abstract, Figures 1-5, Background of the Invention, Summary of the Invention, col 3, lines 4 et seq.	1-26
X	US 5,546,312 A (MOZUMDER et al.) 13 August, 1996 (13.08.1996), Abstract, Figures 1-5, Background of the Invention, Summary of the Invention, col 4, lines 8 et seq.	1-26
X	US 5,966,527 A (KRIVOKAPIC et al.) 12 October, 1999 (12.10.1999), Abstract, Figures 1-7c, Background of the Invention, Summary of the Invention, col.5, lines 58 et seq.	1-26
X	US 5,646,870 A (KRIVOKAPIC et al.) 08 July, 1997 (08.07.1997), Abstract, Figures 1-9B, Background of the Invention, Summary of the Invention, col.7, lines 10 et seq.	1-26
X	US 5,956,251 A (ATKINSON et al.) 21 September 1999 (21.09.1999), Abstract, Figures 1-17, Background of the Invention, Summary of the Invention, col.7, lines 33 et seq.	1-26
X	US 5,781,430 A (TSAI et al.) 14 July 1998 (14.07.1998), Abstract, Figures 1-17, Background of the Invention, Summary of the Invention, col. 3, lines 45 et seq.	1-26

<input type="checkbox"/>	Further documents are listed in the continuation of Box C.	<input type="checkbox"/>	See patent family annex.
*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier application or patent published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 13 June 2002 (13.06.2002)	Date of mailing of the international search report 10 JUL 2002
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703)305-3230	Authorized officer William D. Thomson Telephone No. 703-305-3257

INTERNATIONAL SEARCH REPORT

International application No.  
PCT/IL01/00937

**Continuation of B. FIELDS SEARCHED Item 3:**

**EAST**

search terms: model\$, statistic\$, vector, manufact\$, knowledge adj base, anneal, process, discret\$, range

**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/IL01/00937

**Box III TEXT OF THE ABSTRACT (Continuation of Item 5 of the first sheet)**

The technical features mentioned in the abstract do not include a reference sign between parentheses (PCT Rule 8.1(d)).

**NEW ABSTRACT**

A system and method for monitoring process quality control. A series of input parameters are identified as being significant in effecting the output of a process. Each input parameter has an expected range. Each expected range is discretized into a series of sub-ranges and a vector is built for each possible combination of sub-ranges. The process is then monitored to obtain a statistically significant set of samples, each sample comprising a process output and corresponding inputs (Fig. 2). A knowledge base and model are built (Fig. 5).